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Coronosporidium ecuadorianum gen. & sp. nov. from submerged decaying leaf from Ecuador

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Abstract—A new genus and species *Coronosporidium ecuadorianum* are described and illustrated. The fungus, found on a submerged decaying leaf of an unidentified plant, is distinguished by blastic production of stauroconidia, obpyramidal coronate, 1-septate, and inequilateral sympodial extensions of the conidiogenous cells after rhexolytic conidial secession.

Key words—asexual fungi, freshwater, hyphomycetes, taxonomy, tropics

Introduction

The diversity of microfungi in the Ecuadorian Rainforest has received little attention, especially in freshwater habitats. During a survey of hyphomycetes associated with plant litter submerged in streams from rainforest and cacao plantations near the Patul river, La Aurora (Fig. 1), Azuay province, southwest

Fig. 1. Streams in La Aurora rainforest, Azuay Province, Ecuador.

Ecuador, we collected a fungus that differs remarkably from all previously described genera (Seifert & al. 2011) for which we propose a new genus and species.

Materials & methods

Samples of decaying plant materials were collected and placed in plastic bags for transport to the laboratory, where they were washed, treated according to Castañeda-Ruiz & al. (2016), and placed in humid chambers. Several attempts to obtain this species in pure culture were unsuccessful after using a flamed needle to transfer conidia to corn meal agar mixed 1:1 with carrot extract and incubating at 25 °C. Mounts were prepared in PVL (polyvinyl alcohol, lactic acid) and measurements were made at 1000× magnification. Microphotographs were obtained with an Olympus BX51 microscope equipped with bright field and Nomarski interference optics. The type specimen is deposited in the Herbarium of Universidade Federal de Pernambuco, Recife, Brazil (URM).

Taxonomy

Coronosporidium R.F. Castañeda, Quevedo & D. Sosa, **gen. nov.**

Index Fungorum IF 554557

Differs from *Coronospora* by its polyblastic conidiogenous cells with minute separating cells attached to the conidia, which secede by rhexolytic fracture.

Type Species: *Coronosporidium ecuadorianum* R.F. Castañeda & al.

Etymology: *Corono-* (Latin) meaning crowned + *-sporidium* (Latin) referring to the conidia.

Colonies on the natural substrate effuse. Conidiophores macronematous, mononematous, unbranched, subhyaline to pale brown. Conidiogenous cells monoblastic and polyblastic, integrated, indeterminate, with holoblastic sympodial extension. Separating cells broadly cylindrical. Conidial secession rhexolytic. Conidia solitary, acrogenous or acropleurogenous, stauromorphic, coronate, gray to brown, euseptate.

Coronosporidium ecuadorianum R.F. Castañeda, Quevedo & D. Sosa, **sp. nov.** Figs 2, 3

Index Fungorum IF 554558

Differs from *Coronospora dendrocalami* by the rhexolytic conidial secession and the cylindrical basal frill of the conidia.

Type: Ecuador, Azuay province, La Aurora, 79°21 W 2°34 S, alt. 499 m, on submerged decaying leaf of an unidentified plant in stream, 4.III.2018, coll. A. Quevedo Pinos, E. Leiva Pantoja & J. Ochoa Torres (**Holotype**, URM 91191).

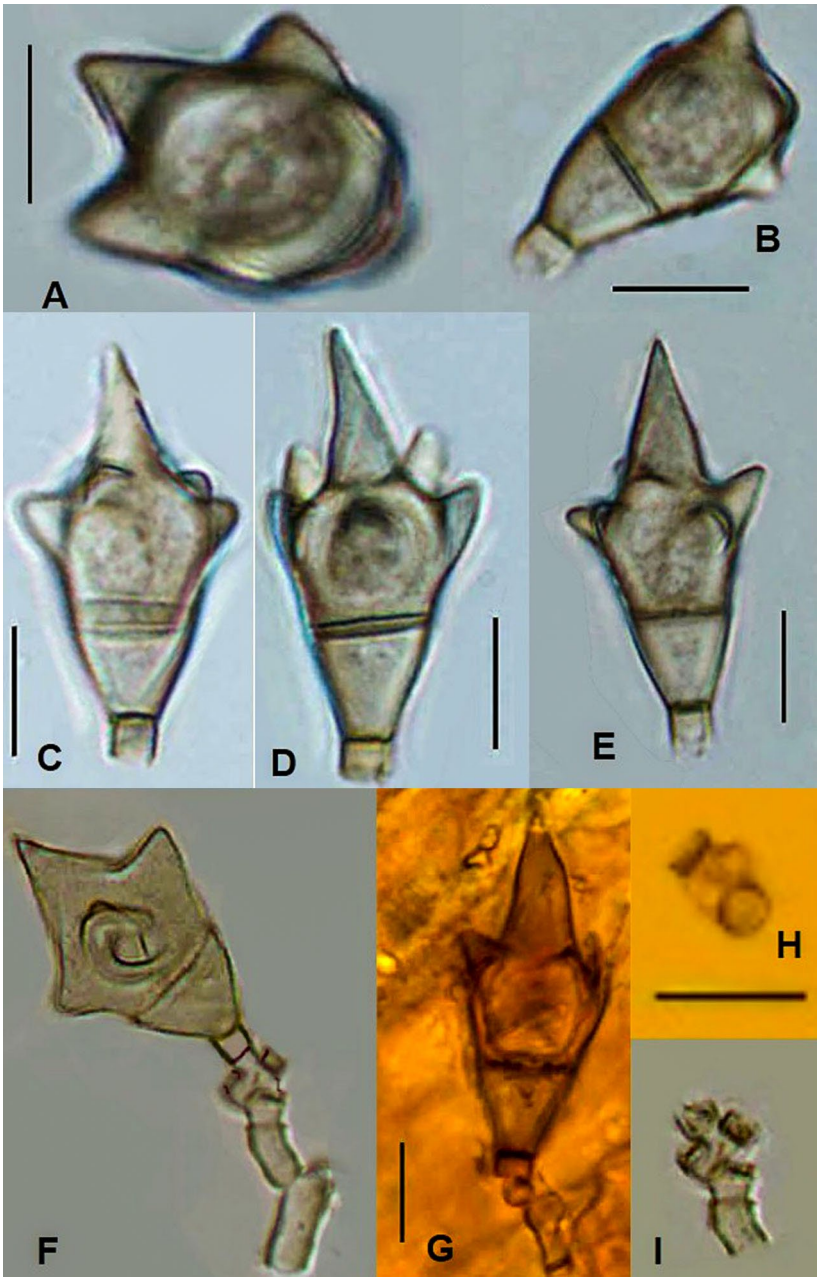
Etymology: *ecuadorianum* (Latin) referring to Ecuador, the type locality.

Colonies on the natural substrate effuse, hypophyllous, granulose, brown to golden gray brown. Mycelium superficial and immersed, composed of septate, unbranched, smooth, 2–3 µm diam, pale brown to subhyaline hyphae. Conidiophores macronematous, mononematous, erect, flexuous, straight or geniculate, unbranched, smooth, 1–3-septate, pale brown to brown, 10–30 × 3.5–4.5 µm, smooth. Conidiogenous cells polyblastic, rarely monoblastic, cylindrical, integrated, indeterminate, terminal, becoming intercalary with frequent sympodial extensions, smooth, pale brown to brown, 8–20 × 3 µm. Separating cells broadly cylindrical, pale brown or pale smoked gray brown, 4–6 µm long, fracturing and remaining as a persistent short peg. Conidial secession rhexolytic. Conidiogenous loci a conspicuous minute collar, slightly ringed after the conidial secession. Conidia solitary, acrogenous, mostly acropleurogenous, broad pyriform, broad turbinate, coronate, inequilaterally 1-euseptate, smoked gray brown to dark gray, smooth-walled, 30–40 × 20–30 µm, with a conspicuous basal frill, 2–3 µm, and toward upper part an acuminate to obtuse, subtriangular central protuberance, 5–18 µm long, encircled near the base by others 4–6 obtuse or rounded, erect or oblique, corniform protuberances, 4–8 µm long, disposed more or less radially at the apical margin.

Note: *Coronosporidium ecuadorianum* is superficially similar to *Coronospora dendrocalami* M.B. Ellis in conidial shape and the polyblastic sympodial extension of the conidiogenous cells, but *C. dendrocalami* has cicatrized, slightly melanized loci of the conidiogenous cells (Ellis 1971). *Anacoronospora diversiseptata* J.S. Monteiro & al. can also be compared with *C. ecuadorianum* in conidial shape, but *A. diversiseptata* has disto- and euseptate conidia produced after enteroblastic percurrent (sometimes sympodial) extension, and its conidiogenous loci are cicatrized and strongly melanized (Monteiro & al. 2016).

Henicospora amazonensis J.S. Monteiro & al. and *H. coronata* B. Sutton & P.M. Kirk resemble *C. ecuadorianum* in conidial shape and rhexolytic conidial secession, but the *Henicospora* species are characterized by monoblastic, determinate conidiogenous cells and the absence of ringed minute collar remnant on the conidiogenous loci (Monteiro & al. 2014, Kirk & Sutton 1980).

Fig. 2. *Coronosporidium ecuadorianum* (holotype, URM 91191). A–E. Conidia with a basal frill of the separating cells. F. Conidiogenous cells, separating cells, and attached conidium. G. Rhexolytic conidial secession in the separating cell. H, I. Conidiogenous cells with ringed collarette-like conidiogenous loci. Scale bars = 10 µm.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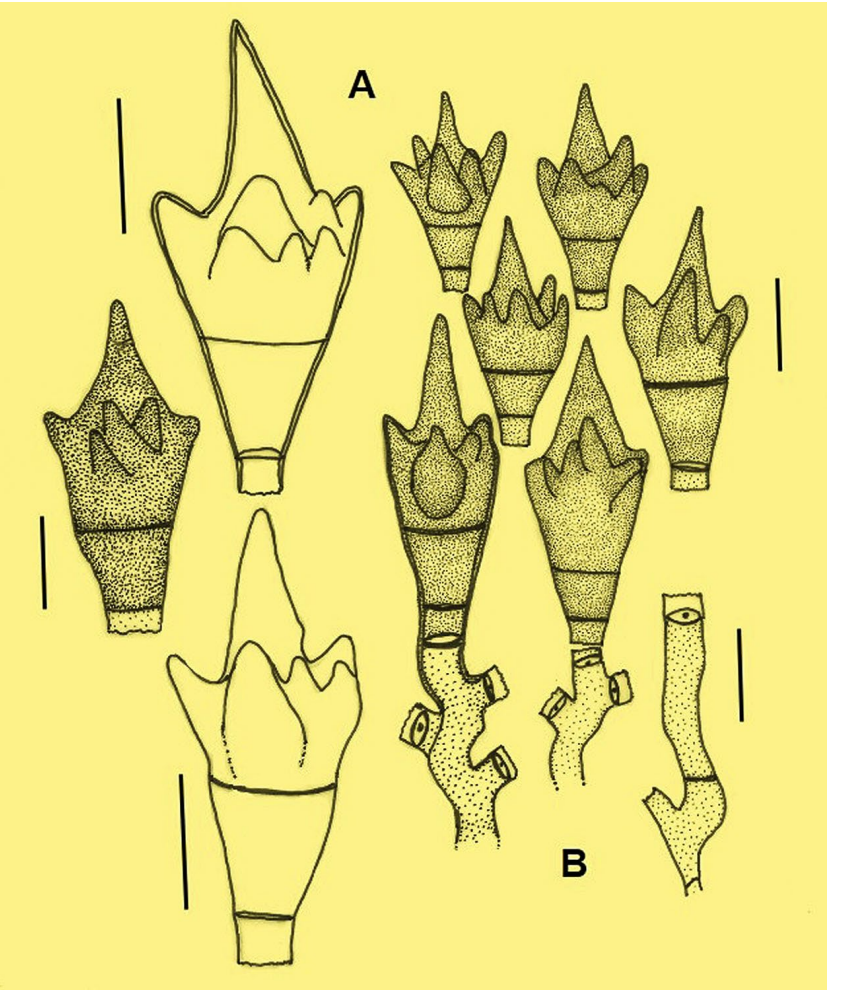

Fig. 3. *Coronosporidium ecuadorianum* (holotype, URM 91191).. A Conidia. B. Conidiogenous cells with the ringed collarette-like conidiogenous loci. Scale bars = 10 µm.

The rhexolytic fracture and ringed, minute collar remnant on the loci in *C. ecuadorianum* are almost the same as observed in *Matsushimiella paraensis* J.S. Monteiro & al. and *M. queenslandica* (Matsush.) R.F. Castañeda & Heredia, but those species have phragmoconidia, which are distoseptate, ellipsoidal, obovate, long ovoid, or oblong, and lacking the conidial arms (Castañeda-Ruiz & al. 2001, Matsushima 1989, Monteiro & al. 2015a,b).

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